

**CLAIMS**

1 1. A system comprising:

2 a charge-emission device having an emitter; and

3 a controllable current source electrically connected to the emitter

4 of the charge-emission device by an electrical path, the controllable

5 current source supplying to the emitter of the charge-emission device

6 over the electrical path a controlled amount of electrical current that

7 produces a potential difference at the emitter with respect to an electrode

8 to induce the emitter to emit electrical charge.

9 2. The system of claim 1, further comprising a current sink connected to

10 the controllable current source for shunting at least a portion of the

11 electrical current to ground upon a detection of a particular charge

12 emission condition.

1 3. The system of claim 2, further comprising protection circuitry for

2 detecting the particular charge emission condition and for activating the

3 current sink upon the detection.

1 4. The system of claim 2, wherein the particular charge emission condition

2 is indicative of an excessive flow of current from the emitter.

- 1    5.    The system of claim 2, wherein the particular charge emission condition  
2        is indicative of an excessive rate of change of the current flowing from the  
3        emitter.
- 1    6.    The system of claim 1, wherein the current source is adjustable to enable  
2        changes to an amount of electrical current being supplied by the  
3        controllable current source to the emitter.
- 1    7.    The system of claim 1, further comprising a controller directing the  
2        controllable current source to provide a predetermined amount of  
3        electrical current.
- 1    8.    The system of claim 1, wherein the charge-emission device is a device  
2        that emits ions.
- 1    9.    The system of claim 8, wherein the emitted ions have a positive charge.
- 1    10.   The system of claim 1, wherein the charge-emission device is a device  
2        that emits electrons.
- 1    11.   The system of claim 1, wherein the charge-emission device emits fluid.
- 1    12.   The system of claim 1, wherein the charge-emission device is a gated  
2        device.
- 1    13.   The system of claim 1, wherein the charge-emission device has an array  
2        of emitters including the emitter and a second emitter, and the

3        controllable current source provides current to each emitter in the  
4        emitter array.

1    14.    The system of claim 1, wherein the controllable current source is a first  
2        current source, the charge-emission device has an array of emitters  
3        including a first emitter and a second emitter, and further comprising a  
4        second controllable current source, the first current source supplying a  
5        first controlled amount of electrical current to the first emitter and the  
6        second current source supplying a second controlled amount of current  
7        to the second emitter.

1    15.    A system comprising:  
2        a micro-fabricated charge-emission device having an emitter; and  
3        controllable means for supplying to the emitter of the charge-  
4        emission device a controlled amount of electrical current that produces a  
5        potential difference at the emitter with respect to an electrode to induce  
6        the emitter to emit electrical charge.

1    16.    The system of claim 15, further comprising means for signaling the  
2        supplying means to supply the controlled amount of electrical current.

1    17.    The system of claim 15, further comprising means for adjusting the  
2        controlled amount of electrical current supplied to the emitter.

- 1 18. The system of claim 15, further comprising means for shunting at least a  
2 portion of the supplied electrical current to ground upon a detection of a  
3 particular condition.
- 1 19. The system of claim 15, further comprising means for detecting a  
2 particular charge emission condition.
- 1 20. A method of controlling an amount of charge emitted by a charge-  
2 emission device, the method comprising:  
3 supplying a controlled amount of current from a controllable  
4 current source to an emitter of a charge-emission device over an  
5 electrical path; and  
6 emitting charge from the emitter of the charge-emission device in  
7 response to the current received from the controllable current source.
- 1 21. The method of claim 20, further comprising adjusting the amount of  
2 electrical current supplied to the emitter by the controlled current  
3 source.
- 1 22. The method of claim 20, further comprising shunting the current  
2 supplied by the controlled current source to ground upon a detection of a  
3 particular charge emission condition.

1   23.   The method of claim 20, further comprising shunting the supplied  
2           current in response to detecting an excessive rate of change in an  
3           amount of charge being emitted by the emitter.

1   24.   The method of claim 20, further comprising shunting the supplied  
2           electrical current in response to detecting an excessive amount of charge  
3           being emitted by the emitter.